Environmental Health in the US-Mexico Border Region
FY 2005 End-of-Year Report

1.) PROJECT ACCOMPLISHMENTS: The primary objective of this project is to develop a bi-national, web-based geographic information system (GIS) containing natural resource data that can be used to further our understanding of the links between the condition of the physical environment and environmental and human health issues (USGS 2004a). The web-based Internet Mapping Service (IMS) serves two functions: first, it provides a geospatial interface loaded with tools that allow the manipulation of spatial data; and second, it serves as a data portal allowing users to integrate the datasets into their own analyses. Accomplishments in FY 2005 pursuant to this goal are:

- Completion of updated project fact sheets in both English and Spanish
- Rollout of the bi-national IMS, developed with OGC compliant specifications.
- Addition of satellite imagery, orthoimagery and integrated geology, hydrology, transportation, geographical names, potential sources of contaminants and boundary datasets to the IMS.
- Addition of integrated demographic data for population density, income levels, and education, networked hydrology, disease cases and rates, potential sources of contaminants, air monitoring stations, and Nexrad daily weather.
- Development of comprehensive website: http://borderhealth.cr.usgs.gov. The site includes background project information, white papers describing methodology for bi-national dataset integration, links to publications and references, and spreadsheets with health and Colonias statistics.
- Creation of an on-line static map and data table library to provide an alternate method of accessing information served on the IMS.
- Publication of Version 1 of bi-national geologic dataset for pilot area in southernmost Texas and parts of Tamaulipas and Nuevo León, México. Version 1 includes limited geologic interpretation and compilation of mainly existing geologic map data.
- Development of methodology for compilation of bi-national geology datasets in pilot area based on remote sensing techniques to serve as a template for compilation of geology along the entire US-Mexico Border.
- Preparation of Version 2 draft of geologic dataset for pilot using new bi-national geologic methodology. Version 2 includes new geologic interpretations important in defining possible links of geology to human health, and when published, will replace the Version 1 geologic map on the IMS website.
- Project development and outreach activities with U.S. and Mexican federal agencies, such as EPA, SEMARNAT, PEMEX, Department of Homeland Security, and the National Geospatial-Intelligence Agency.
- The mineralogy and chemistry of soil samples collected from the Brownsville-McAllen area were completed. Soil samples were collected from the upper-most 5 cm of the soil profile which is considered the soil layer most likely to come in contact with humans and wildlife.

2.) PROJECT WORK PLAN FOR FY 2006: In FY2006 efforts will establish a border-wide base map on the IMS using a medium-resolution basic geospatial framework including satellite imagery and digital elevation models with the locations of the major population centers (Level 1 coverage). This will provide the platform upon which to subsequently overlay more comprehensive datasets. For the remaining sub-areas in Texas and the adjoining Mexican States of Chihuahua, Coahuila, and Nuevo León, we will add specific, local-level datasets such as high resolution aerial photos, land use and land cover, hydrography, water quality, aquifer characteristics, demographics, transportation, potential sources of contaminants and contaminants in biota. Bi-national seamless integration methodologies developed in the Lower Rio Grande Pilot will be used to build integrated datasets. Finally, the project will continue to seek opportunities for integration with existing and future USGS programs. As a case in point, this project could support the proposed USGS Transboundary Aquifer Assessment Program by serving as its geospatial foundation. A comprehensive Work Plan for FY 2006 is attached.

3.) FY 2006 PROJECT BUDGET REQUEST: The FY 2006 budget request is $500,000. A detailed project budget identifying Cost Centers and Budget Categories is presented in the attached Project Work Plan for FY 2006.

4.) ACKNOWLEDGEMENTS / TESTIMONIALS: During the various presentations at conferences and rollouts, members of public works, MPO's, and U.S. and Mexican government agencies have been very complimentary of work done on the Environmental Health Initiative. Once introduced to the available datasets, a significant number of people find that they can integrate the data into their own analysis and research.

> Salvador Sanchez, Director of Statistics and Environmental Information, SEMARNAT, promoted our project to the joint EPA/SEMARNAT Border 2012 program by saying: "Perhaps you remember my mentioning this USGS initiative at our meeting in Laredo and the importance of trying to reach some sort of coordination between the Border 2012 Program and this USGS project, …".
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> Elaine Hernandez, Director of Public Health, Lower Rio Grande Valley Development Council wrote: "You are developing new technology that could be readily applied to our Metropolitan Medical Response System (MMRS) project, funded by FEMA and the Office of Domestic Preparation".

Others including the Harlingen-San Benito MPO Director, a public health inspector for the City of McAllen, an environmental investigator with the Texas Commission on Environmental Quality Region 15 waste program, and professors and students with the University of Texas at Brownsville have already incorporated our project into their business practices.

5.) PROJECT STATUS AND NEWS: The FY 2004/05 pilot effort has developed a functional interdisciplinary team approach, an appropriate geospatial framework, and compatible sets of procedures for continuation and completion of this border-wide project. This initial effort has provided a foundation that will facilitate development of the bi-national GIS and related scientific database products in the remaining geographic reaches of the border.

6.) TECHNICAL TRANSFER ACTIVITIES AND STAKEHOLDER MEETINGS:

- Informational briefing for US-Mexico Border Health Commission, October 2004, El Paso, Texas
- Lower Rio Grande Valley Stakeholder update meetings, November 2004, Brownsville and Edinburg, Texas
- Public Rollout of Project by USGS Regional Director, March 2005, Brownsville, Texas
- Web-X presentation to the US-Mexico Border Environmental Program: Border 2012 Environmental Indicators Task Force consisting of EPA and SEMARNAT Federal Agency representatives, May 20, 2005.
- Overview web demonstration of the project for the DOI US-Mexico Border Field Coordinating Committee, May 26, 2005, Tucson, Arizona.
- Informational briefing for USGS Executive Leadership Team, June 2005, Reston, Virginia
- Conference presentations
    - Association of American Geographers, Denver Co., April 2005
    - Lower Rio Grande Arc User's Group, August, 2005
    - INEGI Mexican National Geography Conference, informal presentations

7.) REPORT PRODUCTS AND BIBLIOGRAPHIC UPDATE:

- USGS Fact Sheet 2004-3140, December 2004, Internet Map Service for Environmental Health in the US-Mexico Border Region.
- USGS Fact Sheet 2004-3140, Deciembre 2004, Servicio de Mapas en Internet para la Salud Ambiental en la Región Fronteriza Entre los Estados Unidos y México
- Duval, J.S., 2005, Aerial gamma-ray survey for parts of Cameron, Hidalgo, and Willacy Counties, Texas: U.S. Geological Survey Open-File Report 2005-1231, Internet only (http://pubs.usgs.gov/2005/1231).
- Duval, J.S., in press, Radon in soils of parts of Cameron, Hidalgo, and Willacy Counties, Texas: U.S. Geological Survey Open-File Report 2005-XXX.
- Page, W. R., Hubbard, B.E., Duval, J.S., Folger, H.W., and Parcher, J.W., in press, Template for compilation of bi-national geologic map datasets in the US-Mexico border region: an example from southern Texas and northeastern Mexico, US-Mexico Border Health Initiative: Geological Society of America Abstracts With Programs, 2006 Southcentral Section Meeting, Norman, Oklahoma.
- Page, W.R., VanSistine, D Paco, and Turner, K.J., in press, Preliminary geologic map of southernmost Texas and parts of Tamaulipas and Nuevo Leon, Mexico: environmental health investigations in the United States-Mexico border region: U.S. Geological Survey Open-File Report.